

Human Dimensions Research Unit

Department of Natural Resources
College of Agriculture and Life Sciences
Cornell University

ANNUAL REPORT

2008

PURPOSE

This 2008 annual report provides an overview of recent research, teaching, and outreach activities of the Human Dimensions Research Unit (HDRU). The report is designed to reflect the work, interests, and capabilities of the HDRU. Publications listed in the report may be requested from the HDRU at the address shown on the cover. A list of HDRU publications is available by request or can be found on the internet at this address: <http://www.dnr.cornell.edu/hdru>



MISSION

The HDRU strives to expand the understanding of academicians, students, natural resources agency staff, and policy makers about the human dimensions of natural resource management and policy by studying human attitudes, values and behaviors associated with natural resource management and applying theory and empirical findings to real-world, contemporary problems. Our research outcomes, which include empirical data, conceptual frameworks, and theoretical insights, are reported in conferences, journals, books, policy briefs, and reports of various types. HDRU research is used by a wide array of decision makers and natural resource practitioners, especially those in state and federal agencies, to develop, implement, and evaluate natural resource policies and management approaches.

HDRU faculty and staff contribute to the teaching and outreach functions of the College of Agriculture and Life Sciences and the Department of Natural Resources. We advise both undergraduate and graduate students, and teach courses concerning natural resources policy and management. Some of our fac-

ulty also have Extension appointments, from which we serve citizens of New York State and beyond.

DESCRIPTION

During 2008, the HDRU and cooperators consisted of 38 faculty, staff, graduate assistants, and undergraduate students. The research program is supported by research grants and contracts from federal and state agencies, nongovernmental organizations, foundations, and the Cornell University Agricultural Experiment Station.

HDRU graduate faculty have membership in the fields of Natural Resources (Resource Policy and Management concentration), Public Affairs, and Water Resources. In 2008, graduate faculty committee members came from the Departments of Communication, Education, Development Sociology, City and Regional Planning, Government, Organizational Behavior, and Natural Resources (Resource Ecology and Management concentration). Our program's primary geographic focus is domestic, but in recent years has included some international work.

The HDRU has earned an international reputation in the development of the human dimensions specialization of natural resource management. The oldest unit of its kind located in a university setting, its history dates from the early 1970s. The success of the HDRU has been greatly enhanced by a partnership of approximately 35 years with the NYS Department of Environmental Conservation's Division of Fish, Wildlife, and Marine Resources.

In 2008, Tom Brown retired as Leader of the Human Dimensions Research Unit after over 30 years of service. Dan Decker assumed Directorship of the Unit in 2009.

Human
Dimensions
Research
Unit

FACULTY AND STAFF

UNIT LEADERS:

Tommy L. Brown, Senior Research Associate and Unit Leader, Natural Resources. Now retired.

Specializations: Economic and social benefits of resource use; incorporating human dimensions perspectives in natural resources management; outdoor recreation trends; survey research methods.

Daniel J. Decker, Professor and Unit Director

Specializations: Integration of human dimensions insights into wildlife management decision making, policy, planning, and practice; stakeholder involvement in wildlife management; community-based natural resources management; risk perception and communication related to wildlife management.

Barbara A. Knuth, Professor and Unit Associate Director; Senior Associate Dean, College of Agriculture and Life Sciences

Specializations: Integrating human dimensions into natural resources decision making; community-based natural resource management; risk management and communication related to fishery and wildlife management; program evaluation.

HDRU FACULTY AND SENIOR STAFF:

Shorna Broussard Allred, Associate Professor

Specializations: Human dimensions of natural resource management; natural resource policy; environmental attitudes and behavior; with emphasis on forest and water resources.

T. Bruce Lauber, Senior Research Associate

Specializations: Citizen participation and education in natural resource management; human dimensions of wildlife damage management; gender and natural resource management.

Richard C. Stedman, Assistant Professor

Specializations: Sense of place; community resilience; impacts of social and environmental change on wildlife recreation and community; risk and policy; environmental attitudes and behaviors; community-based resource management; land

owner attitudes and behaviors; coupled human/ecological systems.

FACULTY COLLABORATORS:

Paul D. Curtis, Associate Professor and Extension Wildlife Specialist, Department of Natural Resources

Specializations: Resolving conflicts between people and wildlife; citizen participation in decision making; outreach and policy education.

Janis L. Dickinson, Associate Professor, Department of Natural Resources and Laboratory of Ornithology

Specializations: Citizen science as a vehicle for environmental stewardship; evolutionary approaches to understanding environmental behavior; urban birds as links to nature.

John F. Forester, Professor, Department of City and Regional Planning

Specializations: Community and environmental dispute resolution; micro-politics and ethics of planning processes.

Joe D. Francis, Associate Professor, Department of Development Sociology.

Specializations: Social measurement, survey research, linear statistical models, geographic information systems and spatial statistics.

Gary R. Goff, Senior Extension Associate, Department of Natural Resources

Specializations: Extension programming in forestry and wildlife management for non-industrial, private forest owners; sportsmen education; wetlands.

Katherine A. McComas, Associate Professor, Department of Communication

Specializations: Risk, science, and environmental communication; community involvement and public participation; trust and credibility related to science communication.

Rolf Pendall, Associate Professor and Director of Graduate Studies, Department of City and Regional Planning

Specializations: Land-use planning and regulation; urban and suburban sprawl.

Scott J. Peters, Assistant Professor, Department of Education

Specializations: Action research; community development; history, philosophy, and democratic theory and practice in Extension and Land-Grant education.

Max F. Pfeffer, Professor and Chair, Department of Development Sociology

Specializations: Protected area and watershed management; conflicts of environmental values and interests.

Clifford W. Scherer, Associate Professor, Department of Communication

Specializations: Risk communication and risk perception; public participation.

James E. Shanahan, Chair, Department of Communication, Fairfield University

Specializations: Mass media and the environment; effects of media on environmental attitudes; role of communication institutions in citizen participation and environmental issues.

Peter J. Smallidge, Senior Extension Associate, Department of Natural Resources

Specializations: Extension programming in forest management and stewardship for private landowners, county extension educators, youth, and professional foresters.

Pamela S. Tolbert, Professor and Chair, Department of Organizational Behavior

Specializations: Formal organizations; social stratification and organizations; occupations and professions.

Arthur L. Wilson, Professor and Chair, Department of Education

Specializations: The role of power in history and philosophy, program planning, and adult learning in adult education; research expertise in discourse analysis, hermeneutics, and cultural studies.

Nicholas Winter, Assistant Professor, Department of Government. Currently Assistant Professor, Department of Politics, University of Virginia.

Specializations: Public opinion and political behavior; race and politics; gender and politics; political methodology; public policy; social theory and politics.

Y. Connie Yuan, Assistant Professor, Department of Communication

Specializations: Organizational communication; the role of social capital and information technology in knowledge management; social network analysis; research methods.

CORNELL VISITING FACULTY COLLABORATOR:

Peter Otto, Assistant Professor, Dowling College School of Business; Professor MIS/IT, Graduate School of Business Administration, Zurich, Switzerland; Visiting Fellow, Department of Natural Resources, Cornell University

Specializations: System dynamics modeling; group decision making; IT systems implementation and alignment.

RESEARCH ASSOCIATES & SPECIALISTS:

Nancy A. Connelly, Research Specialist

Specializations: Recreation satisfactions and user preferences; participation trend analysis; survey research methodology.

Jody W. Enck, Research Associate

Specializations: Sociocultural and motivational aspects of wildlife recreation; stakeholders' attitudes about management of overabundant wildlife species, potential social feasibility for restoring rare/extirpated species.

William F. Siemer, Research Specialist

Specializations: Motivational aspects of recreational participation; wildlife-related attitudes and values; educational program evaluation.

RESEARCH SUPPORT STAFF:

Marjorie A. Peech, Administrative Assistant

Specializations: Unit office management; website maintenance; word processing; administrative assistance.

Karlene K. Smith, Research Aide

Specializations: Survey implementation; interviewing; database management; content analysis.

GRADUATE RESEARCH STAFF:

Andrea Armstrong, Graduate Assistant

Specializations: Conservation practice adoption and policy; urbanization; water quality.

Chris Clarke, Graduate Assistant, Department of Communication

Specializations: Health and environmental communication; risk perception; wildlife disease.

Darrick Evensen, Graduate Assistant

Specializations: Wildlife disease management and policy; risk perception.

Heather Wiczorek Hudenko, Graduate Assistant

Specializations: Wildlife management and policy; human-wildlife interactions; wildlife conservation.

Cynthia A. Jacobson, Assistant Director, Alaska Dept. of Fish and Game

Specializations: Wildlife policy; governmental affairs; and collaboration.

Tania M. Schusler, Environmental Issues Educator, Cornell Cooperative Extension of Tompkins County. Currently Core Faculty, Antioch University New England

Specializations: Community-based conservation; co-management of wildlife; youth leadership in local environmental action.

Heather A. Van Den Berg, Graduate Assistant

Specializations: Wildlife policy and management; social network analysis; conflict resolution; adult conservation education; volunteerism.

Heidi E. Kretser, Livelihoods & Conservation Coordinator, North American Program, Wildlife Conservation Society

Specializations: Natural resource stewardship behaviors in exurban settings; human influences on wildlife near protected lands.

Daniela B. Raik, Natural Resources Management Advisor, Conservation International

Specializations: Co-management of wildlife; capacity building in community-based natural resources management.

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SUMMARY OF 2008 RESEARCH ACTIVITIES

Wildlife Resources Management and Policy

Public Involvement in Wildlife Management

Communities across the country have increasingly called for wildlife management solutions tailored to their particular situations, especially with respect to human-wildlife conflicts. In addition to seeking involvement in defining problems, goals, objectives, and methods, some communities have expressed willingness to share responsibility for implementing management. For community-based management to be effective, community capacity often needs to be increased. Recent studies have made substantial progress in defining the relevant elements of community capacity and exploring social learning that occurs as communities work with state agencies on local wildlife problems. Other research is examining stakeholder interests and how various groups attempt to use the political process to achieve these wildlife management goals.

Sustaining and Improving Hunting and Trapping in New York: Public Attitudes, Conflict Resolution, and Political Activism

Funded by: N.Y.S. Dept. Environ. Conservation and Cornell Univ. Agric. Exper. Sta.

HDRU Contact Person:

Heather Van Den Berg, hav5@cornell.edu

Social conflicts among wildlife stakeholders are increasingly prevalent across New York State (NYS), creating a potentially contentious management climate for the Department of Environmental Conservation (DEC). This study focuses on social conflicts involving waterfowl hunting and furbearer trapping. In the case of waterfowl hunting, social conflicts emerge mainly as waterfront residents object to waterfowl hunters discharging firearms over water, in close proximity to homes. Similarly, social conflicts over furbearer trapping erupt when residents are alerted to the presence of wildlife trapping in their communities by media coverage of the non-target capture of a domestic dog. In response, stakeholders increasingly seek to change local town codes, hunting regulations, or environmental conservation laws through political activism. The outcomes of such political activism have the potential to greatly restrict access to or opportunities for wildlife harvest activities, as well as influence public perceptions about wildlife as a resource.

To better understand the factors contributing to political activism over wildlife harvest activities, our objectives are to: (1) compare network characteristics of wildlife stakeholders engaged in collective actions in the two conflict contexts; (2) determine the extent to which stakeholders receive information from key network organizations and how much they trust each organization; (3) identify the content of network relationships among the political activists; (4) expand and test collective action theory to include the influence of friendship and adversarial tie strength; and (5) determine the relationship between predicted participation in collective action and spatial scale organizational membership seeking to influence wildlife management. The outcomes of this work will identify the processes and mechanisms behind stakeholders forming social networks of activist groups. Implications from this research will likely focus on how the DEC might proactively engage networks of stakeholders to increase communication with the goal of managing disputes locally, based upon collaborative and productive participation in social networks and collective actions.

HDRU, in collaboration with DEC, selected four communities for in-depth case-study analysis of social conflicts. Brookhaven and Canandaigua were selected for the waterfowl hunting conflicts; Queensbury and Southampton were selected for the conflicts over wildlife trapping. In 2008, we completed exploratory research in the four study communities to inform the design of an in-depth interview questionnaire, which will be implemented in the case-study communities, and a statewide mail-back questionnaire intended to provide insight into stakeholder attitudes toward waterfowl hunting/wildlife trapping and general wildlife management, communication networks, and emerging political activism. In 2009, we will collect data from stakeholders involved with the conflicts and political activism over waterfowl hunting and wildlife trapping in the four communities, as well as implement the statewide mail-back questionnaire.



Presentations:

- Van Den Berg, H.A. And B.A. Knuth. 2008. Conceptualizing social conflicts over furbearer trapping and waterfowl hunting. Northeast Fish and Wildlife Conference, Galloway, NJ. April.
- Van Den Berg, H.A., B.A. Knuth, and Y.C. Yuan. 2008. Expanding human dimensions of wildlife management research to include social network analysis. International Symposium on Society and Resource Management, Burlington, VT., June.
- Van Den Berg, H.A. and B.A. Knuth. 2008. Role of social networks and collective actions for influencing wildlife management. Pathways to Success: Integrating Human Dimensions into Fish and Wildlife Management Conference, Estes Park, CO. September.

**The Social Framework for
Community-based Deer Management**

Funded by: N.Y.S. Dept. Environ. Conserv.

HDRU Contact Person:

Bruce Lauber, tbl3@cornell.edu

Past research has shown how certain characteristics of urban and suburban communities can influence their ability to manage deer successfully. Local leadership, relationships, partnerships, knowledge, a sense of common purpose, and other community characteristics (the “social framework” of the community) may facilitate deer management in some communities and inhibit it in others. Research also recognizes that the

characteristics of the social framework that are most important may change as the community progresses through different stages of deer management. Our current study has two components.

In the first component, we are following the evolution of deer management issues in three New York State communities (Greenburgh, Rye, and Manlius), documenting how the “social framework” in each community influences deer management, and how that influence changes throughout the management process. We are devoting special attention to the roles that relationships and partnerships play in helping to formulate and disseminate ideas, share knowledge, and influence others’ opinions. During 2007, we assessed the status of deer management in our three study sites and analyzed data collected through a series of telephone interviews of individuals involved in deer management at each site.

In the second component of this study, we explored how media coverage can contribute to the development of capacity for community-based deer management. We analyzed newspaper coverage in regional New York State newspapers over six years and assessed the potential contributions this coverage could make to learning. The coverage is most relevant to identification of deer management objectives and of methods that could help to achieve those objectives. Despite the fact that relationships and dialogue between stakeholders (through public meetings, task forces, surveys, and other forums) have been shown to have an important influence on the success of community-based deer management, these topics receive relatively little coverage. A description of this component of the work is being submitted to *Society and Natural Resources*.

**Human Dimensions of White-tailed Deer and Black Bear
Management—New Needs, New Approaches**

Human interactions with white-tailed deer (*Odocoileus virginianus*) and black bear (*Ursus americanus*) increased as wildlife ranges and populations expanded, and human populations spread across the landscape. While many human-wildlife interactions are positive, some are negative. The HDRU continues to focus much work on management issues related to positive and negative impacts of white-tailed deer and black bears.

We have examined many facets of white-tailed deer management. Impacts of deer on farmers, other rural landowners, suburban homeowners, and other stakeholders have been subjects of our efforts to understand the multifaceted importance of deer management. Our research has revealed factors affecting social accept-

ability of various deer management approaches, especially in suburban areas. Preferences and satisfactions of deer hunters, challenges they face in gaining access to private lands, and land access policies of rural landowners also have been topics of study for purposes of understanding factors affecting implementation of effective deer management programs. We also have designed, tested and evaluated processes for public input to deer management.

Burgeoning white-tailed deer populations in New York and many other states have created new challenges for deer managers and society in general as people have been trying to learn how to coexist with deer. Similarly, black bear populations and their ranges have expanded in New York and some neighboring states. The need for

effective population management and site-specific problem alleviation has led managers and researchers into new territory. The HDRU has had opportunities to collaborate with several public and private cooperators to engage in a more thorough analysis of deer population management at the landscape level, and we have also worked with NYSDEC as they have developed a state-wide black bear management plan. This research has been used by other states to inform their approaches to bear management.

Historically, we have worked primarily on the human dimensions of deer and bear management. In recent years we have also worked with biologists and population modeling specialists to integrate the biological and human dimensions of deer management in a way that allows us to examine more meaningfully scales and impacts of deer population management. In addition, we have worked with NYSDEC on a passive adaptive impact approach to management.

Assessing and Mitigating Deer Impacts at a Landscape Scale with an Integrated Research and Extension Program

Funded by: Cornell Univ. Agric. Exper. Sta. and Cornell Cooperative Extension

Collaborators: Paul Curtis and Gary Goff (Dept. Nat. Resour.); Marie Kautz and Dave Riehlman (DEC Region 7 office, Cortland); Renee Jensen and Tania Schusler (Cornell Coop. Ext., Cayuga and Tompkins Counties, respectively)

HDRU Contact Person:
Nancy Connelly, nac4@cornell.edu

The goal of this study is to evaluate whether the management of deer populations and associated impacts can be improved by working with landowners to assess and enhance access for deer hunting. A survey of landowners in two towns in central New York was conducted in 2007 and the results (discussed in last year's annual report) were used to design extension education programs that took place in 2008.

HDRU staff participated in extension workshops held in the counties where the landowner surveys were conducted. Staff reported on the results of the surveys and discussed landowner liability issues, which were a concern raised by survey respondents.

Planning began for the third year of this project, which will shift focus and look at the economic impacts of deer on forest regeneration.

Publication:

Connelly, N.A., T.L. Brown, G.R. Goff, and P.D. Curtis. 2008. Assessing deer impacts and management op-

tions at a landscape scale: A survey of landowners in the Towns of Caroline and Venice. HDRU Publ. 08-2. Dept. Nat. Resour., Cornell Univ., Ithaca, NY. 24 pp.

Presentation:

Connelly, N.A., T.L. Brown, G.R. Goff, and P.D. Curtis. 2008. Visualizing deer impacts and management options using GIS and human survey data. Paper presented at the 14th International Symposium on Society and Resource Management, Burlington, VT, June.

Landscape Ecology of White-tailed Deer in Agro-forest Ecosystems

Funded by: Cornell Univ. Agric. Exp. Sta., N.Y.S. Dept. Environ. Conserv.

HDRU Contact Person:
Jody Enck, jwe4@cornell.edu

This study has complemented our work assessing human dimensions outcomes of changes in deer management regulations in New York State made by DEC. We conducted a longitudinal evaluation from 2002-05 to examine factors influencing landowners' and hunters' perceptions of desirable/tolerable impacts related to deer and the acceptance capacity of these stakeholders for deer. Given that these factors might differ at the landscape level due to differences in the characteristics of the deer population as well as the stakeholder populations, we collaborated with researchers at Michigan State University to compare and contrast factors affecting Wildlife Stakeholder Acceptance Capacity (WSAC) in New York and Michigan.

One of the main differences in factors identified via our inter-state comparison was that landowner characteristics can influence both the kinds of deer-related impacts of importance to landowners and their acceptance of deer. Almost all the landowners in New York were long-time resident farmers who expressed frustration about deer damage to crops as well as concern about both economic and human safety impacts associated with the risk of deer-related vehicle accidents. Despite these concerns, nearly all New York landowners also expressed a desire for feeling connected to nature through their observations of deer locally. Over half of the farmers in our New York study area also hunted deer and sought positive hunting-related impacts from their experiences with deer.

In Michigan, many of the landowners were exurbanites who had moved to more rural areas seeking a greater connection to nature, but who also reported various concerns about deer damage to plantings around their homes. The relatively small percentage of farmers in the Michigan study area also expressed concern about crop damage. Those who hunted also expressed the

desire for positive hunting experiences. In both New York and Michigan, landowners generally reported that their deer-related acceptance capacity had been exceeded, although the specific impacts involved differed. Hunters in both states reported that levels of positive impacts generally were less than desirable. Further, we found that for landowners in both states (more so than hunters), recognition and assessment of some impacts are context specific, and that satisfied stakeholders tend to have different tolerances for impacts in addition to different experienced levels of those impacts.

Application of WSAC and Adaptive Impact Management (AIM) to the QDM evaluation has shed light on the attitudes and behaviors of stakeholders participating in a voluntary management intervention. Various insights pointed to the need for a mandatory intervention to achieve objectives for certain impacts. DEC used these insights to develop new regulations for management units where stakeholders subsequently have called for changes in their deer-related interactions and associated impacts. We are currently working on a final report on our longitudinal evaluation of the cooperative.

Hunters' Evaluations of QDM Antler Restrictions in Southeastern New York (NYSDEC Region 3)

Funded by: N.Y.S. Dept. Environ. Conserv.

HDRU Contact Person:

Jody Enck, jwe4@cornell.edu

DEC initiated a pilot program of mandatory antler restrictions (only adult bucks with ≥ 3 points on a side are legal) in southeastern New York--wildlife management units (WMUs) 3C and 3J for the 2005 hunting season, and expanded to include WMUs 3H and 3K in 2006. HDRU has conducted mail surveys with hunters from those WMUs after each hunting season during the pilot program to assess hunters' attitudes and hunting-related behaviors. Much of our assessment built on the AIM concept applied to our longitudinal evaluation of the voluntary QDM cooperative in central New York.

In general, deer hunters from the pilot WMUs are satisfied with their overall deer-hunting experiences, but dissatisfied with their buck-hunting experiences. Study results have shown that the urgency to shoot at a minimally legal but "undesirable" buck, and anxiety about being shot by unsafe hunters remain too high (i.e., above tolerable levels). At the same time, hunters' perceptions of the naturalness of the buck age structure (i.e., based on their own estimates of the ratio of legal to sub-legal antlered bucks), and fairness among hunters are too low (i.e., below desirable levels). Despite these shortcomings, the vast majority of hunters in these WMUs support continuation of the mandatory antler restrictions.

Willingness to see the pilot program continued seems to be greatly influenced by hunters' hopes for better future conditions than by their currently unsatisfactory experiences. Our monitoring has found that levels of negative impacts have been improving slightly although they still are generally reported to be intolerable. On the other hand, hunters have perceived no change in their experienced levels of positive impacts, which remain below desirable levels. Hunters have expressed that achievement of desirable levels of positive impacts is more important than reducing levels of intolerable, negative impacts.

Publications

Enck, J.W. and T.L. Brown. 2008. Evaluation of antler restrictions in DEC Region 3: 2nd year in 3C and 3J, and 1st year in 3H and 3K. HDRU Publ. 08-4. Dept. Nat. Resour., Cornell Univ., Ithaca, NY. 19 pp.

Enck, J.W. and T.L. Brown. 2008. Deer hunters' assessment of antler restrictions in wildlife management units (WMUs) 3C, 3J, 3H, and 3K during the 2007 hunting season. HDRU Publ. 08-7. Dept. Nat. Resour., Cornell Univ., Ithaca, NY. 40 pp.

Statewide Deer Hunter Survey: Trends and Management Preferences

Funded by: N.Y.S. Dept. Environ. Conserv.

HDRU Contact Person:

Jody Enck, jwe4@cornell.edu

Over the last two decades, DEC has sponsored periodic statewide surveys of deer hunters (i.e., 1987, 1990, 1994, and 1999) to monitor deer hunters' behaviors, interests, satisfaction levels, and support for possible changes in hunting regulations. In 2007, we conducted another statewide survey to obtain trend data and to assess support for two possible regulation changes: (1) making the buck bag limit one antlered buck for all hunters regardless of how many hunting implements they obtained licenses to use (e.g., archery, muzzleloader, regular firearms), and (2) implementing antler restrictions throughout the state in an effort to protect most yearling bucks from harvest.

We conducted a mail survey of 4,000 New York State deer hunters, stratified into four geographic areas: (1) Metro NYC including Long Island, (2) Southeastern NY, (3) Northern NY, and (4) Central-western NY. The overall response rate was 47%. A follow-up telephone survey with 200 non-respondents to the mail survey revealed only a few differences in socio-demographic, behavior, and attitudinal variables between respondents and non-respondents.

Monitoring of trends revealed that the average age of hunters continues to increase (now about 48 years), along with the average years of deer-hunting experience and average lifetime deer harvest (particularly of antlerless deer). Further, recruitment of younger hunters seems to be only about one-third of the level recorded in the late 1980s, and retention of older hunters is averaging only about 50% over the last 10 years.

Across New York State, large numbers of deer hunters reported taking advantage of opportunities to hunt with a bow and/or muzzleloader in addition to a rifle or shotgun. More hunters than ever before also are applying for antlerless permits to use during the special implement seasons as well as during the regular season. However, having these opportunities has not maintained high levels of buck-hunting satisfaction.

Overall, most hunters are dissatisfied with their buck-hunting experiences and some changes may be warranted in the regulations affecting those opportunities. One possible change that likely would be widely supported is some kind of regulation to protect most yearling bucks from harvest. Not only do most hunters in all geographic areas of the state believe such a change would increase their hunting satisfaction and would support the idea of protecting yearling bucks, but their reasons for supporting the idea seem to be based on reasonable expectations about changes in their hunting experiences. It is unlikely, however, that either of these changes would improve the hunter recruitment and retention rates experienced in New York over the last two decades. If DEC decides to target those concepts for management interventions or research, the greatest benefit would be to do so outside of the realm of deer management. Such an effort likely would be a long-term process requiring substantial collaborative efforts with many partners. Of more immediate benefit would be continued monitoring of trends in characteristics of hunters and continued research into trade-offs among impacts from hunting experiences of importance to hunters.

Publication:

Enck, J.W. and T.L. Brown. 2008. 2007 statewide deer hunter survey: Participation during the '06 seasons, opinions about hot-button issues, and trends in characteristics of hunters. HDRU Publ. 08-5. Dept. Nat. Resour., Cornell Univ., Ithaca, NY. 81 pp.

Misuse of Deer Management Permits and Under-reporting of Deer Harvest

Funded by: Cornell Univ. Agric. Exp. Sta., N.Y.S. Dept. Environ. Conserv.

HDRU Contact Persons:

Rich Stedman, rcs6@cornell.edu,
Jody Enck, jwe4@cornell.edu

Deer Management Permits (DMPs) are issued to deer hunters in a Wildlife Management Unit (WMU) to allow the taking of antlerless deer. The number of DMPs issued and used "successfully" (i.e., a hunter takes an antlerless deer) largely determines whether deer populations increase or decrease in the WMU. If the number of applicants is larger than the number of DMPs available, recipients are selected randomly. In some WMUs, DMPs outnumber applicants and thus are easy to get. In other units, applicants far outnumber DMPs, or DMPs may not be offered at all. Evidence exists from law enforcement officers and hunters that some deer are taken on DMPs in the wrong WMU. DEC needs an estimate of the rate of DMP misuse to prevent a situation whereby antlerless deer may be over-harvested in some WMUs and under-harvested in others. An estimate of the rate of DMP misuse will determine the gravity of the situation, and give a baseline for evaluating corrective actions.

Another related and equally challenging issue is that deer harvest reporting has declined slowly over the years, but with a 14% drop in 2002 when a telephone reporting system was put in place. As of 2008, the statewide deer harvest reporting rate was 45%, and DEC would like to increase it. Thus, a need exists to understand why hunters do not comply with the mandatory reporting regulation. Based on these challenges, we will be working toward achieving two objectives: (1) determine why hunters fill DMPs in the wrong WMU, and (2) determine the most common reasons why hunters do not report deer take.

Other Publications on Deer Management:

Leong, K.M., D.J. Decker, T.B. Lauber, D.B. Raik, and W.F. Siemer. 2009. Overcoming jurisdictional boundaries through stakeholder engagement and collaborative governance: Lessons learned from white-tailed deer management in the U.S. Pgs. 221-247 in K. Anderson, E. Eklund, M. Lehtola, and P. Salmi, eds. *Beyond the Rural-Urban Divide. Cross-Continental Perspectives on the Differentiated Countryside and its Regulation*. Research in Rural Sociology and Development Vol. 14. Emerald Group Publ, LTD, Bingley, UK.

Stedman, R.C., P. Bhandari, A.E. Luloff, D.R. Diefenbach, and J.C. Finley. 2008. Deer hunting on Pennsylvania's public and private lands: a two-tiered system of hunters? *Human Dimensions of Wildlife* 13(4):222-233.

Ward, K., R.C. Stedman, A.E. Luloff, J.S. Shortle, J.C. Finley. 2008. Categorizing hunters by typologies useful to game managers: A latent-class model. *Society and Natural Resources* 21:215-219.

Input for a Statewide Black Bear Management

Funded by: N.Y.S. Dept. Environ. Conserv.

Collaborator: Peter Otto

Cooperator: Tania Schusler, Cornell Cooperative Extension

HDRU Contact Person:

Bill Siemer, wfs1@cornell.edu

Between 2001 and 2008, HDRU staff worked with members of the New York State Department of Environmental Conservation (NYSDEC) to develop and implement an adaptive impact management (AIM) approach to black bear management. This year, HDRU staff completed a comprehensive case study of that first full imple-

mentation of impact management. A summary of key findings from qualitative interviews was reported to agency staff in fall, 2008. The full case study was written as a Ph.D. dissertation (W.F. Siemer), accepted in December 2008.

Publication:

Siemer, W.F. 2009. Toward a practice of impacts management: Insights from an exploratory case study. Ph. D. Dissertation, Cornell Univ., Ithaca, NY.

Other Publication on Bear Management:

Gore, M.L., B.A. Knuth,, C.W. Scherer, and P.D. Curtis. 2008. Evaluating a conservation investment designed to reduce human-wildlife conflict. *Conservation Letters* 1:136-145.

Public Access to Private Lands

Public Access to Private Lands for Recreation and Tourism in the Northern Forest

Funded by: NE States Research Cooperative

Collaborators: Lisa Chase (Univ. of Vermont); John Daigle, (Univ. of Maine); Walt Kuentzel (Univ. of Vermont); Rob Robertson (Univ. of New Hampshire)

HDRU Contact Person:

Tom Brown, tl4@cornell.edu

This study examines the rate and nature of changing land tenure involving the sale of both individual private parcels and large industrial forest holdings, and the effects of these changes on access. It also assesses the attitudes and behaviors of landowners related to recreational access, and the incidence of posting of private lands. The Cornell University contribution of this project evaluated the coverage of limited liability recreation statutes of Northern Forest states and the impacts of liability-related concerns on landowner decisions. In 2007-08 this work was extended to a nationwide study. Two presentations at national conferences resulted from this work.

Publications:

Brown, T.L. and T.A. Messmer. 2008. Trends in wildlife and privatization. Pgs 275-288 (Chapt. 20) in M.J. Manfredo, J.J. Vaske, P.J. Brown, D.J. Decker and E.A. Duke. *Wildlife and Society: The Science of Human Dimensions*. Island Press, Washington DC.

Brown, T.L. In press. Improving access through strengthening state recreational liability statutes. *Transactions, North American Wildlife and Natural Resources Conference, 2008.*



Presentation:

Brown, T.L. 2008. Improving hunting access through strengthening state recreational liability statutes. National Shooting Sports Foundation, Annual Summit, Colorado Springs, CO., June.

Program Assessments and Evaluations

Resource management agencies increasingly seek formal assessments before establishing new programs or modifying existing programs. They also periodically evaluate ongoing programs. HDRU research staff bring diverse disciplines to bear on program assessments and utilize a comprehensive evaluation strategy that examines program conceptual foundation, design, implementation, and impacts. We continually refine this approach as needed and identify elements that facilitate or impede program success or failure. Such evaluation allows resource managers and program directors to make better decisions about program modification and continuation.

Wildlife Funding/Policy Linkages: Using State Wildlife Action Plan Priorities to Shape Policies and Direct Expenditures at Multiple Levels of Government

Funded by: Wildlife Habitat Policy Research Program of the National Council for Science and the Environment

HDRU Contact Person:

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All 50 states have recently completed federally mandated State Wildlife Action Plans (SWAPs) in an effort to protect wildlife species before they become endangered. Because these plans consider the needs of all wildlife throughout the entire United States, some stakeholders consider them the best comprehensive blueprint for wildlife conservation available. The Doris Duke Charitable Foundation, through the Wildlife Habitat Policy Research Program, has funded a variety of research projects intended to contribute to the implementation of SWAPs.

Through this project, we are exploring how collaborative partnerships contribute to the implementation of SWAPs. Data collection is taking place in three phases. First, we conducted telephone interviews of 60 people throughout the United States who are knowledgeable about SWAP implementation. Based on these

interviews, we have begun to catalog and characterize the collaborative SWAP implementation efforts that are currently underway. Then we selected six diverse examples of collaborative efforts to implement SWAPs for more intensive study. We have begun to travel to the sites associated with each of these efforts to identify the factors that both promote and inhibit their success. Finally, we will identify and interview “catalysts” (individuals who play key roles in initiating or sustaining collaborative action) to determine why these catalysts are effective. Towards the end of the project, we will conduct a workshop with practitioners to develop recommendations for promoting collaborative efforts to implement SWAPs. Results will be disseminated through a variety of written reports and oral presentations.

Our results will include: (1) a typology of collaborative efforts to implement SWAPs, based on categorizing existing efforts according to a variety of variables; (2) a complete list of collaborative efforts to implement SWAPs encountered during our project in all 50 states, including a description of conservation actions implemented and conservation outcomes achieved; (3) a complete list of organizations involved in collaborative efforts to implement SWAPs, listed both individually and by type; (4) a description of the factors that promote or inhibit collaborative efforts to implement SWAPs, including an assessment of the collective and individual resources needed to initiate, sustain, and succeed at these collaborative efforts; and (5) a list of suggested actions for promoting collaborative implementation of SWAPs.

Presentation:

Lauber, T.B. 2008. Wildlife funding/policy linkages: Using State Wildlife Action Plan Priorities to Shape Policies and Direct Expenditures at Multiple Levels of Government. Wildlife Habitat Policy Research Program Committee meeting. San Francisco, CA. April.

Understanding Attitudes and Values of Wildlife Stakeholders

New York Suburban Coyote Study

Funded by: N.Y.S. Dept. Environ. Conserv.

Collaborators: Paul Curtis, Dan Bogan

HDRU Contact Persons:

Heather Wieczorek Hudenko, hah29@cornell.edu
Bill Siemer, wfs1@cornell.edu

The human dimensions component of the New York Suburban Coyote Study was conducted to provide an understanding of human perceptions and behaviors related to coyotes in two suburban areas in New York State. This situation analysis, evaluating the extent and nature of public experiences with coyotes, was completed in 2008. Results from this study will assist NYSDEC and local communities with coyote-related management and decision-making efforts.

We employed a mixed-method approach, using face-to-face, semi-structured, in-depth interviews with key informants (n = 40) and telephone surveys of Westchester County residents (n = 1160) and Saratoga County residents (n = 1438).

Our situation analysis revealed that awareness of coyote presence and sightings of coyotes were relatively high in the study communities, but problematic interactions with coyotes were uncommon. About half of the residents surveyed reported enjoying coyotes to some extent and the majority of respondents who completed an in-depth questionnaire found the likelihood of injury from a coyote acceptable. Despite these findings, we found that concern about coyotes in suburban areas was rather high and tolerance for their presence in most suburban spaces was low. These data indicate that the potential for widespread negative human-coyote interactions is low, but concern about coyote-related issues is high.

A comparison between Westchester County informants and survey respondents revealed several limitations of dependence on key informants to assess circumstances within the community. For example, the majority of key informants believed residents were unaware of the presence of coyotes in the county, but the study found that 85% of respondents were aware and 52% had seen a coyote. The disparity between key informants' and residents' perceptions of coyotes has implications for information gathering and communication by wildlife agencies and other organizations. These data urge caution about reliance on informants to guide inquiries and influence management strategies. Despite this caution, informant input can be helpful, as suggested by other measures in our study that indicated agreement between informants and survey respondents. For instance, the survey data corroborated key informants' belief that while few residents actually experienced problems with coyotes, many were concerned about potential risks of coexistence with coyotes.

Through a comparison of telephone survey respondents, we characterized how demographic characteristics, area of residence, and history of coyote presence in a community might influence residents' beliefs, attitudes, and behaviors toward coyotes. To evaluate these concepts, we used responses from longtime residents in Westchester and Saratoga counties, and newcomer and longtime Saratoga County residents. We found that neutral experience with a coyote (e.g., seeing a coyote) generally was associated with positive attitudes, and negative experience (e.g., having a problem with a coyote) was associated with negative attitudes and elevated risk perceptions. People living in an area with a longer history of coyote presence tended to express more positive attitudes and less concern than those living with coyotes for a shorter period of time. Tenure of residence in an area with coyotes was not a strong predictor in our models. The results imply that people may

adjust to living with coyotes if negative impacts occur at low and tolerable levels.

This inquiry provided baseline information on coyote-related human beliefs, attitudes, and behaviors in NY. Based on our results, managers and organizations wishing to engage in communication efforts about coyotes may want to target the high concern associated with coyote presence at this time. Our findings support the use of mixed-method information gathering techniques for human-wildlife issues. In addition, we gained insight into the way in which experience with coyotes might influence people's perceptions and behaviors. The need for more information about individuals who experience negative interactions with coyotes, and possibly other carnivore species, was highlighted. Understanding these relationships will have broader implications for human-carnivore coexistence.

Publications:

- Siemer, W.F., H. Wieczorek Hudenko, and D.J. Decker. 2008. Coyote management in residential areas: human dimensions research needs. Pp. 421-430 in D.L. Nolte, W.M. Arjo, and D. Stalman, eds. *The Twelfth Wildlife Damage Management Conference Proceedings (April 9-12, 2007)*, Corpus Christi, TX. Wildlife Damage Management Working Group, The Wildlife Society.
- Siemer, W.F., H. Wieczorek Hudenko, and D.J. Decker. 2008. Coyote management in residential areas: Human dimensions research needs. Pp. 131-136 in R.M. Timm, ed. *Wildlife Damage Management Working Group of The Wildlife Society*. InstantPublisher.com, Collierville, TN.
- Wieczorek Hudenko, H., W.F. Siemer, and D.J. Decker. 2008. Humans and coyotes in suburbia: Can experience lead to sustainable coexistence? HDRU Publ. 08-9. Dept. Nat. Resour., Cornell Univ., Ithaca, NY. 22pp.
- Wieczorek Hudenko, H., W.F. Siemer, and D.J. Decker. 2008. Living with coyotes in suburban areas: Insights from two New York State counties. HDRU Publ. 08-8. Dept. Nat. Resour., Cornell Univ., Ithaca, NY. 67pp.
- Wieczorek Hudenko, H., D.J. Decker, and W.F. Siemer. 2008. Reliance on informants in wildlife management situation analysis: Shortcut or shortcoming? *Human Dimensions of Wildlife* 13(6): 459-470.
- Wieczorek Hudenko, H. 2008. Exploring attitudes and experiences associated with human-coyote relationships in suburban New York. Master's thesis, Cornell Univ., Ithaca, NY.

Wieczorek Hudenko, H., D.J. Decker, and W.F. Siemer. 2008. Stakeholder insights into the human-coyote interface in Westchester County, New York. HDRU Publ. 08-1. Dept. Nat. Resour., Cornell Univ., Ithaca, NY. 19pp.

Presentations:

Wieczorek Hudenko, H, D.J. Decker, and W.F. Siemer. 2008. Humans and coyotes in suburbia: Can familiarity lead to sustainable coexistence? Society for Conservation Biology Annual Conference, Chattanooga, TN, July.

Wieczorek Hudenko, H., D.J. Decker, W.F. Siemer. 2008. Coyotes in suburbia: The challenge of assessing community perspectives. International Symposium on Society and Resource Management, Burlington, VT, June.

The Exurban Frontier: Anticipating Human-wildlife Interactions Where We Live, Work, and Play Using Landscape and Social-psychological Variables

Funded by: Amer. Assoc. Univ. Women, Wildlife Conservation Society; Cornell Univ. Agric. Exper. Sta.; Nat. Science Found., Doctoral Dissertation Awards; Adirondack Kieckhefer Grants

Collaborators: Rolf Pendall (Dept. of City and Regional Planning); Joe Francis (Dept. of Development Sociology); Paul Curtis (Dept. of Natural Resources)

HDRU Contact Person:
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This research explored the relationships among exurban development, human-wildlife interactions, and conservation attitudes using a spatially predictive model incorporating landscape and social-psychological variables. Conflicts between humans and wildlife are increasing. Reasons for this increase include landscape changes leading to habitat loss, habitat recovery, and movements of wildlife populations into or out of areas near human communities; loss of top predators resulting in abundance of some species populations; and most importantly, a continuously increasing human population. Exurban growth, defined as densities of one house per 5 to 40 acres, acts as a catalyst for other physical and social landscape changes. Little research has specifically connected exurban development to increases in human-wildlife interactions. This study addresses two objectives: (1) to assess which demographic characteristics, knowledge, and attitudes of residents are associated with whether a human-wildlife interaction is perceived as positive or negative and subsequently reported to authorities; and (2) to develop and test the applicability of models combining

landscape and social variables to predict locations of human-wildlife conflict. The research uses an interdisciplinary approach to address how the exurban landscape, demographic characteristics, and attitudes combine to influence patterns of human-wildlife interactions.

In 2008, we focused on combining landscape variables from geographical information systems with data on local land-use practices and socio-demographics from a mail survey of 730 landowners to predict locations of human-black bear (*Ursus americanus*) interactions and perceptions of those interactions in the Adirondack Park in Northern New York. We used models to determine which landscape and local landowner practices increased the probability of an interaction with bears and found that exurban housing densities (2-16 ha per unit) and rural housing densities (>16 ha per unit) near high quality bear habitat increased the likelihood for human-bear interactions. Local landowner practices such as attracting wildlife, feeding birds, raising farm animals, and maintaining recreation trails also increased the likelihood of an interaction.

Specific experiences with severe interactions (e.g. bear entering a home), general concerns about wildlife, and actual property damage were most closely related to perceiving a negative interaction with bears. Negative and indifferent perceptions of bear interactions were associated with less support for wildlife protection programs. Given that housing density and landscape characteristics were more important in influencing human-bear interactions compared to local practices, the results suggest an opportunity exists for collaboration among land-use planners, wildlife managers, and conservation practitioners to effectively link research and policy to influence housing configurations and proactively minimize human-bear conflicts.

Publications:

Kretser, H.E., J. Hilty, M. Glennon, J. Burrell, Z. Smith, and B.A. Knuth. 2009. Challenges of governance and land management on the exurban/wilderness frontier in the USA. Pgs. 277-304 in K. Andersson, E. Eklund, M. Lehtola, and P. Salmi, eds. *Beyond the Urban-rural Divide: Cross-continental Perspectives on the Differentiated Countryside and its Regulation*. Emerald Group Publishing Ltd., Bingley, UK.

Kretser, H.E. 2008. The exurban frontier: Anticipating human-wildlife interactions where we live, work, and play. Ph.D. Dissertation. Cornell Univ., Ithaca, NY.



Kretser, H.E., P.J. Sullivan, and B.A. Knuth. 2008. Housing density as an indicator of spatial patterns of reported human-wildlife interactions in Northern New York. *Landscape and Urban Planning* 84:282-292.

Presentations:

Kretser, H.E. 2008. Individual and societal implications associated with human-wildlife interactions in urban and exurban areas of northern New York. International Symposium on Society and Resource Management, Burlington, VT., June.

Kretzsr, H.E. 2008. Landscape characteristics and social survey data as predictors of human-black bear interactions in the Adirondack Park, USA. Adirondack Research Consortium, Lake Placid, NY, May; Pathways to Success: Integrating Human Dimensions into Fish and Wildlife Management Conference, Estes Park, CO, September.

Landowner Attitudes toward Early-successional Habitat in New York

Funded by: N.Y.S. Dept. Environ. Conserv.

HDRU Contact Persons:

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Early-successional, woody habitats (ESH) and many of the wildlife species that rely on them are in widespread decline across New York and the Northeast. Many of these same species are of great conservation concern, and some are NYS Listed Species. Given that about 85% of the state's 32 million acres are privately owned, restoration and maintenance of ESH on private lands is a management issue for DEC. Pressures on these private lands are increasing daily from conurbation, commerce, industry, and agriculture. Working with private landowners presents both significant challenges and great opportunities to enhance the delivery of both DEC's and DNR's missions, including, but not limited to: biodiversity conservation, wildlife management, recreational access, and environmental quality protection.

This study, initiated in 2008, will explore the current state of ESH in New York and help guide efforts for restoration and maintenance of ESH. Study objectives are: (1) determine private forest landowner attitudes, awareness, motivating factors, actual decisions, and constraints toward types of management practices on their lands, (2) develop a forestry engagement typology of private forest landowners to better understand target audience and inform outreach efforts, and (3) determine the context for private forest landowner management decisions.

HDRU already has made substantial progress describing this management context, identifying several contextual factors that likely will influence the ability of DEC, local communities, and other conservation partners to manage for and sustain ESH in New York State. For example, because forests in New York are unable to grow as fast as those further south, the pulp and paper industry has looked elsewhere for more economically competitive sources of fiber and pulp. This could be offset to some extent by an increasing demand for wood pellets and locally produced wood products associated with recent calls for the "greening of America." At the same time, natural population growth in the U.S., increasing longevity, increasing immigration, and shifting migration patterns within the U.S. all have contributed to expansion of suburban areas, leading to a high rate of conversion of rural land to developed uses that has exceeded even the rate of growth of the population since 1960. Against this broader backdrop, various national and state policies likely provide numerous opportunities or constraints for management of ESH. Also, regionally and at the state level, a myriad of organizations and programs could affect management of ESH by private landowners. The degree to which any of these might be facilitative or constraining may depend on the scope of the issue in NY State: where is the need for ESH greatest, which kinds of landowners are most important to engage, and what is the most beneficial size, shape, and species composition of a managed ESH?

A survey of private landowners in a targeted area of New York is planned for 2009 to help achieve the other objectives.

Publication:

Enck, J. and M. Odat. 2008. Public attitudes and affective beliefs about early- and late-successional stages of the Great Northern Forest. *Journal of Forestry* 107(7):388-395.

Understanding the Human Dimensions of Human-wildlife Habituation: Developing Knowledge for Interventions to Foster Positive Interactions Between People and Wildlife

Funded by: National Park Service

HDRU Contact Person:

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While human-wildlife interactions may benefit both wildlife and humans, interactions that lead to conflict are a pressing issue for wildlife managers at the local, state, and federal level. A key factor believed to lead to human-wildlife conflict is habituation. The presence of humans or human activity are the primary causes of habituation in wildlife, yet little is known about the way in which human beliefs, attitudes, and behaviors may

influence this phenomenon. Researchers and managers nevertheless have identified the possible relationship between habituation, or tolerance, in humans and wildlife as an important component in this issue, and as an area in need of inquiry. National Park Service (NPS) managers specifically have identified the need to attend to human-wildlife habituation issues in and around protected areas. In response to this need, the Biological Resources Management Division (BRMD) of the NPS launched an inquiry into human-wildlife habituation in 2008. To begin the research agenda, a Task Agreement between NPS and Cornell University was established to explore the human dimensions component of human-wildlife habituation. The HDRU team (D.J. Decker and H. Wiczorek Hudenko) worked with BRMD staff and a NPS habituation steering committee to begin exploratory inquiry in 2008. An online survey was conducted with park managers June-August to examine the breadth and depth of habituation concerns across parks. The HDRU team and several NPS staff conducted a workshop on habituation at the Pathways to Success: Integrating Human Dimensions into Fish and Wildlife Management in September. The workshop provided insights from managers and researchers into human-dimensions aspects of human-wildlife habituation. Information gathered during this exploratory phase will be used to guide more structured inquiry in 2009.

Workshop:

Leong, K.M. H. Wiczorek Hudenko, and D.J. Decker, Co-organizers. 2008. Human dimensions of human-wildlife habituation in and around protected areas. Conducted at Pathways to Success: Integrating Human Dimensions into Fish and Wildlife Management Conference, Estes Park, CO, September.

Presentation:

Wiczorek Hudenko, H. 2008. Human-wildlife habituation: A review. Pathways to Success: Integrating Human Dimensions into Fish and Wildlife Management Conference, Estes Park, CO, September.

**Human Dimensions of Wildlife Disease:
Understanding Perceptions of Risk and Identifying
Implications for Developing Effective
Communication Messages**

Funded by: National Park Service, Biological Resources Management Division; Cornell Univ. Agric. Exper. Sta.; Doris Duke Conservation Fellowship

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As concern over wildlife disease proliferates across scientific and public realms, wildlife and disease management agencies have identified a need to understand what risks people perceive related to infectious diseases. This study seeks to advance understanding of how perceived risks from zoonotic diseases are formed and identify the implications of those perceptions for developing effective communication messages regarding diseases in wildlife. The National Park Service (NPS) recognizes the need to understand how its own employees and residents of gateway and neighboring communities perceive risks with respect to important wildlife-associated diseases. The prospects of negatively skewed risk perceptions with respect to wildlife-associated disease among substantial segments of the American public are concerning to both wildlife conservation and human health professionals. Especially as agencies initiate publicly visible disease monitoring efforts, wildlife health and park managers will benefit from understanding the level and type of risk people associate with wildlife diseases. Parks are only a portion of the larger landscape and this understanding could also be applied broadly by other federal and state agencies.

To understand better how to construct communications to alert the public to the risks of wildlife disease, our objectives are: (1) to gain insight about how mass media frame risks of wildlife-associated disease, (2) to identify stakeholders' most important perceived risk factors for wildlife-associated disease in parks and park-proximate communities, as well as the heuristics individuals apply in responding to such risks, and (3) to develop a strategy for communication initiatives that may best allow the NPS to address stakeholder concerns related to Highly Pathogenic Avian Influenza and other diseases. To examine these research questions, we will rely on multiple risk perception theories and models, including cultural theories of risk, heuristic processing explanations of risk perception, and cognitive/affective processing theories.

We began this research in June 2008. To date, we have completed a literature review of research on risk perceptions about wildlife disease and relevant risk perception theory that could be applied to wildlife disease research. We have also finalized selection of four NPS park units that will serve as the study sites for our field research: Fire Island National Seashore (NY), Golden Gate National Recreation Area (CA), Sleeping Bear Dunes National Lakeshore (MI), and Wrangell-St. Elias National Park and Preserve (AK). In 2009, we plan to conduct oral history interviews with community members residing near our four study sites, questioning them about their experience with wildlife disease. We also intend to interview park staff at each study site about their knowledge of, perceptions of, and experience with wildlife disease.

Publication:

Evensen, D.T.N., D.J. Decker, and R.C. Stedman. 2009. Capturing concern: understanding perceptions of wildlife-associated disease risk. HDRU Publ. 09-1. Dept. Nat. Resour., Cornell Univ., Ithaca, NY. 21 pp.

Presentations:

Evensen, D.T.N. 2008. An ill predicament: understanding perceptions of wildlife-associated disease risk. International Symposium for Society and Resource Management, Burlington, VT. June.

Evensen, D.T.N. 2009. Efficacy information in media coverage of infectious disease risks: An ill predicament? Department of Natural Resources Graduate Student Association Symposium, Ithaca, NY. January.

Developing Knowledge to Manage Economic, Health, and Safety Risks of Wildlife for Individuals and Communities in New York

Funded by: Cornell Univ. Agric. Exper. Sta.

HDRU Contact Person:

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The objectives of this project are to increase understanding about (1) public perceptions of emerging economic, health, and safety risks; and (2) how risk perceptions affect stakeholders' (a) attitudes about wildlife and natural areas, (b) behaviors in response to perceived risks, (c) expectations for wildlife and public land management, and (d) attitudes concerning wildlife risk management strategies.

Information obtained through this project will help natural resource managers conduct risk communication activities and engage stakeholders in processes to manage wildlife-related risks faced by individuals and communities.

This three-year project, which began in late 2008, will use a multi-phase, multi-method approach. Phase I of the project will consist of qualitative inquiry focused on wildlife-related risk perception. We will utilize findings from qualitative inquiry to design instruments for quantitative data collection using standard survey methods (Phase II). Phase III of the project will involve synthesis of findings and development of one or more outreach publications, suitable for use by wildlife management agencies, park and protected area managers, Cornell Cooperative Extension educators, and nongovernmental organizations with an interest in natural resource management in New York.

Presentation:

Evensen, D., D. Decker, and R. Stedman. 2008. Plague or paradise? Assessing perceptions of wildlife disease risk. International Symposium on Society and Resource Management, Burlington, VT., June.

Other Publication on Wildlife Resources Management and Policy:

Decker, D.J., W.F. Siemer, K.M. Leong, S.J. Riley, B.A. Rudolph, and L.H. Carpenter. 2008. Conclusion: What is wildlife management? Pgs. 315-327 in M.J. Manfredo, J.J. Vaske, P.J. Brown, D.J. Decker, and E.A. Duke, eds. *Wildlife and Society: The Science of Human Dimensions*. Island Press: Washington, D.C.

Other Presentations on Wildlife Resources Management and Policy:

Decker, D.J. , W.F. Siemer, K.M. Leong, S.J. Riley, B.A. Rudolph, and L.H. Carpenter. 2008. What is wildlife management? Pathways to Success: Integrating Human Dimensions into Fish and Wildlife Management Conference, Estes Park, CO, September.

Enck, J.W. 2008. Conceptual model of hunter recruitment and retention based on the Theory of Hunter Identity Production (THIP). Workshop for the Human Dimensions Study Group of the National Flyway Council. Kansas City, MO, January.

Enck, J.W. 2008. Conceptual model of recruitment and retention of (great) white goose hunters. Workshop for the Human Dimensions Study Group of the National Flyway Council. Kansas City, MO, January.

Enck, J.W. 2008. Conceptual models of hunter recruitment and retention. Summer Directors' Meeting of Midwest Association of Fish and Wildlife Agencies. Estes Park, CO, July.

Fulton, D.C., A. Raedeke, J.W. Enck, D. Humburg, D. J. Case, K. Hunt. 2008. Development of a waterfowl hunter recruitment and retention strategy. Pathways to Success: Integrating Human Dimensions into Fish and Wildlife Management Conference, Estes Park, CO, September.

Enck, J.W. 2008. Becoming a conservationist: reconceptualizing recruitment and retention in the context of the big picture and the inner mirror. Colorado Conservation Summit. Keystone, CO, October.

Fisheries Resources Management and Policy

Understanding Participation, Attitudes, and Values Associated with Fisheries Management

Many stakeholders with diverse interests are affected by fisheries management decisions and activities. Understanding the attitudes and values of these stakeholders toward management lays a base for predicting not only the acceptability of various management strategies, but also the likely impacts that will be produced through management programs. This information is useful to fisheries agencies, and also to communities and marine trades groups who wish to better market the fisheries resources of their localities and regions.

We are currently completing New York's fifth statewide angler survey since these surveys began in 1973. These and other surveys have provided a wealth of information on Lake Ontario fishing, which we are currently synthesizing through a grant from the New York Sea Grant Institute. In addition, we are currently conducting a membership survey for the American Fisheries Society.

Great Lakes Sportfishing Participation and Economic Impacts: Synthesis and Outlook

Funded by: New York Sea Grant Institute

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New York's Great Lakes sport fisheries have gone through several stages since major stockings of salmonids began around 1970. This study examined trends and likely causal factors related to changes in sportfishing demand in New York's Great Lakes waters over the past 30 years. Quantitative models were developed to examine the relative contribution of various biological and socioeconomic factors to changes in fishing participation and to forecast changes in fishing participation over the next 3 to 5 years.

These models examined the dependent variables (1) fishing license sales statewide in New York, (2) sales in Great Lakes counties, and (3) fishing boat trips taken on Lake Ontario. The first two models used the same explanatory variables because license sales in Great Lakes counties closely paralleled sales statewide. The number of licenses sold was positively related to (1) the number of people living in New York aged 18 to 44 and (2) the weight of salmon stocked statewide, lagged by three years to better match the year when the salmon would be caught by anglers. The third variable

in these models was a dummy variable associated with the number of years since a license fee increase. In the year of a fee increase, the number of licenses sold declines and then gradually increases as anglers adjust to the increased price.

The third model explaining fishing trips to Lake Ontario also contained both biological and socio-economic variables. The number of trips taken each year was positively associated with the number of salmon stocked in Lake Ontario and the average number of bass harvested per trip. Trips taken were negatively associated with a variable measuring time. The time variable may be acting as a surrogate for two interacting phenomena: the novelty of Great Lakes salmonid fishing specifically, which appears to be gradually declining, and the declining interest in fishing and outdoor recreation seen nationally.

The models were used to forecast changes in fishing participation. Specifically for Lake Ontario, after consulting with NYSDEC on future stocking plans and predictions for bass harvest, the model predicts a decline in fishing trips of 32% in the ensuing five years. Different assumptions about bass harvest could be made that would show some variation in the forecast, but those effects would be relatively minor because the contribution of bass harvest to the overall prediction in the model is small.

A report and several papers, are being prepared discussing the results and potential uses of the data.

Presentation:

Connelly, N.A., and T.L. Brown. 2008. Understanding the social and biological factors influencing the trend in fishing participation on Lake Ontario, New York: Synthesis and outlook. Pathways to Success: Integrating Human Dimensions into Fish and Wildlife Management Conference, Estes Park, CO, September.



New York Statewide Angler Survey

Funded by: *N.Y.S. Dept. Environ. Consserv.*

HDRU Contact Person:

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To manage New York's fisheries in ways that maximize human benefits, comprehensive information is needed periodically on the fishing patterns, preferences, and attitudes of anglers as well as the economic benefits of New York's fisheries. In 2007-2008 surveys were undertaken to gather such information, similar to previous statewide angler surveys. However, unlike previous surveys, which were conducted using a single mailing and 12-month recall, this survey was implemented at three different times during the calendar year. We expect that dividing the 2007 calendar year into three parts will reduce the amount of recall bias associated with angler trip recollection. Questionnaires were sent to 17,000 licensed anglers in June and October of 2007 and January of 2008. Follow-up telephone calls with 200 nonrespondents were conducted after each phase to check for non-response bias.

Of the 17,000 questionnaires mailed out during each phase, between 700 and 1,100 were undeliverable and between 6,000 and 8,000 completed questionnaires were returned. This resulted in adjusted response rates ranging from 38% for phase 2 to 49% for phase 3. Data from the three phases were combined and estimates of fishing effort and expenditures were calculated. The results of this analysis will be presented in a report due out in early 2009.

Initial analysis of angler preferences showed six factors that played a role in their decisions about where to fish. The first factor we named "catching fish." Many anglers based their decision on where to fish on the species of fish found in a water body and their past experience catching fish there. Many anglers also wanted a "pleasant, convenient location," a second factor. It contained items such as good access, uncrowded location, and close to home/camp. The third factor, which was also important to many anglers, was fishing in a new location. The other three factors were important to some anglers, but for others they were not important at all. These factors included fishing in a natural location with wild fish, being able to harvest the fish, and fishing in a vacation spot or tournament location. More detailed analysis of these results, as well as information gathered on angler satisfaction with fisheries management and angler opinions on specific management questions, will be presented in a report to be completed in 2009.

Presentation:

Connelly, N.A., S. Keeler, T.L. Brown, and S. Hurst. 2008. What types of fishing opportunities are an-

glers looking for: Can New York provide those opportunities? Paper presented at the 138th Annual Meeting of the American Fisheries Society, Ottawa, Canada, August.

Human Responses to Viral Hemorrhagic Septicemia Virus in the Great Lakes: Implications for Agency Communication

Funded by: *U.S. Depart. Agric. Animal and Plant Health Inspection Service (APHIS)*

HDRU contact person:

Bruce Lauber, tbl3@cornell.edu

Viral Hemorrhagic Septicemia Virus (VHSV) was first detected in Lake Ontario in 2005, and it has spread rapidly there. VHSV affects fish, causing mortality in some cases, although it does not pose a risk to people. Considerable concerns exist about the potential impacts of VHSV and its management on recreational fishing, aquaculture, and the bait fish industry. Management responses to VHSV, focusing on regulation and education, have occurred at both the state and federal levels. These efforts have focused on reducing the movement of infected fish and water between water bodies.

This study will provide insights about key stakeholder groups (agency staff members, anglers, aquaculturists and commercial fishers) in the Great Lakes region to help inform the design and implementation of VHSV educational efforts by state and federal agencies. Our objectives are to: identify the range of knowledge, awareness, and concern regarding VHSV among key stakeholder groups; identify sources of information used by these groups regarding VHSV; characterize the willingness of stakeholders to respond to VHSV and the actual behavioral responses of these stakeholders; and assess the degree to which stakeholder behavior is consistent with agency recommendations and regulations.

During the fall of 2008, we began telephone interviews with representatives of agencies and other organizations concerned with the spread of VHSV. These organizations include state, federal, and tribal management agencies and extension organizations, such as the state Sea Grant programs. Questions have focused on concerns about VHSV, management responses taken, and constraints on management responses.

Other Publications on Fisheries Resources Management and Policy

Knuth, B.A. 2008. Film review of *Weather the Storm*. Bullfrog Films.

Knuth, B.A., C. McOliver, E.K. Silbergeld, N.A. Connelly, and A. Faulds. 2008. Contaminant and pathogen considerations in urban fisheries: Balancing the fishing experience with the need to protect human health. *American Fisheries Society Symposium* 67:143-164.

Lepak, J.M., H.A. Shayler, C.E. Kraft, and B.A. Knuth. 2009. Mercury contamination in sport fish in the Northeastern United States: Considerations for future data collection. *BioScience* 59(2):174-181.

Forest Lands Management

Over the last decade, HDRU has developed a continuous research thrust in the human dimensions of forest management. In 1999–2001, we evaluated the impacts of several programs designed to assist Northern New York landowners following the severe ice storm of 1998. During 2003–2005, we worked with NYSDEC's Division of Lands and Forests to assess use and visitor satisfaction with hiking experiences in the Adirondacks. Two additional projects funded through the Northeastern States Research Cooperative have provided opportunities to examine community collaboration in forest management and public awareness of and attitudes toward a range of forest management practices that enhance ecosystem management.

Much of our applied research related to forest management has implications for Extension programs. We are continuing our close working relationship with Cornell Cooperative Extension with a new project aimed at better identifying the interests and needs of underserved forest owners in New York.

Dr. Rich Stedman and Dr. Shorna Broussard Allred have several projects related to community forestry and the economic dependence of such communities. Descriptions of those projects are included in this section.

Linking Underserved Forest Owners to Assistance for Enhanced Environmental Sustainability

Funded by: Cornell Univ. Agric. Exper. Sta. and Cornell Cooperative Extension

Collaborator: Peter Smallidge (Dept. of Natural Resources)

HDRU Contact Person:
Nancy Connelly, nac4@cornell.edu

This research-Extension project was designed to better understand the motivations, educational needs, and management activities of forest owners in New York so that new strategies and educational materials can be developed to reach them. A survey of landown-

ers was conducted and reported on last year. This year's efforts were focused on disseminating the results of the survey through publications and presentations.

Publications:

Broussard, S., N.A. Connelly, T.L. Brown, and P.J. Smallidge. 2008. Management activities of private forest landowners in New York State. *Research and Policy Brief Series, Issue 15*, CaRDI, Cornell Univ., Ithaca, NY.

Broussard, S., N.A. Connelly, T.L. Brown, and P.J. Smallidge. 2008. Information access and preferences among private forest landowners in New York State. *Research and Policy Brief Series, Issue 19*, CaRDI, Cornell Univ., Ithaca, NY.

Presentation:

Connelly, N.A., and S. Broussard. 2008. Reaching out to family forest owners in New York State: Using survey results to design outreach strategies. New England/New York Joint Annual Meeting of the Society of American Foresters, Saratoga Springs, NY, February.

Addressing Private Forestland Parcelization in the Hudson River Watershed: An Integrated Research and Extension Approach

Funded by: Cornell Univ. Agric. Exper. Sta., Cornell Cooperative Extension

HDRU Contact Person:
Shorna Broussard Allred, srb237@cornell.edu

Collaborators: Richard Stedman, Peter Smallidge

Forestland parcelization is recognized as one of the most serious challenges facing forests today. Parcelization divides large single ownership forest tracts into smaller parcels with diverse ownerships, often with development and a reduction in forest area. Parcelization is a pivotal force impacting the

sustainability of forestlands. This study employs an approach that integrates research and extension and focuses on the Hudson River Basin from the central Adirondacks to NYC. The heavily forested area provides a model system to study due to the variety of ownership and market patterns. The project team, which includes collaborators in the Department of Environmental Conservation and Cornell Cooperative Extension, will focus on three target audiences that are central to the issue of parcelization: forest landowners, public service foresters, and private sector foresters. First, we will examine parcelization patterns, drivers, positive and negative effects, and current strategies in the study area through a historical analysis of New York State Office of Real Property data and focus groups with stakeholders. This will allow the researchers to understand both the extent and effects of parcelization in the study area. This data will then inform the extension approach which will focus on the geographic areas where parcelization poses the greatest concern. A committee of partners and stakeholders will advise the structure and implementation of project activities.

The Well-Being of Forest Dependent Communities

Funded by: Canadian Forest Service

HDRU Contact Person:

Rich Stedman, rcs6@cornell.edu

The well-being of communities that depend on the extraction and processing of forest-based resources is crucially important to definitions of the sustainability and resilience of the forest industry. Defining this relationship is somewhat difficult, based on the myriad indicators of well-being, and multiple definitions of dependence. We are involved in an on-going study with colleagues in the Canadian Forest Service, and the New Rural Economy Project at Concordia University (Quebec) which examines this relationship in Canada, and also compares these outcomes with those obtained in the United States. This project involves quantitative analysis of cross-sectional and longitudinal secondary data obtained from Statistics Canada that addresses the measurement of forest dependence, well-being, the effect of forest dependence and well-being, and how this relationship varies across place, time, and indicators used to represent well being.

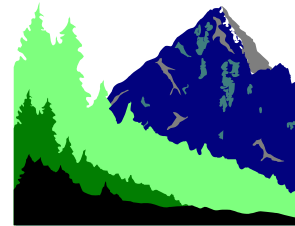
This project moved forward in 2008 on several fronts. Collaborations continued with Canadian Forest Service personnel on data acquisition, analysis, and writing about the relationship between resource dependence and community well being. In addition to the two papers published in this area, we have nearly completed matching of the 2006 Census of Canada with resource dependency data assembled by Bill Reimer's New Rural Economy group at Concordia University

(Montreal). Several papers involving the relationship between ecological diversity, economic diversity, and community well-being are in preparation based on this data set. Second, Rich Stedman has (with Keith Tidball) undertaken a theoretical examination of the concept of resource "dependence" and how it relates to system resilience.

Publications:

Wellstead, A. and R. Stedman. 2008. Intersection and integration of First Nations in the Canadian Forestry Sector. *Journal of Aboriginal Economic Development* 6:1. 30-43.

Patriquin, M.N., V.A. Lantz, R.C. Stedman, W.A. White. 2008. Working together: a reciprocal wood flow arrangement to mitigate the economic impacts of natural disturbance. *Forestry* 81(2):227-242.



Presentations:

Patriquin, M., J. Parkins, and R. Stedman. 2008. The paradox of dependency: Exploring economic diversity and natural resource dependency in rural Canadian communities. International Symposium for Society and Natural Resources, Burlington, VT. June.

Stedman, R., and K. Tidball. 2008. Vulnerability or confidence: Expanding the concept of "dependence" in resource dependent communities. Annual Meetings of the Rural Sociological Society, Manchester, NH, July.

Private Forest Owners of Pennsylvania

Funded by: Pennsylvania Bureau of Forestry

HDRU Contact Person:

Rich Stedman, rcs6@cornell.edu

The decisions of private forest landowners are of paramount importance to the sustainable management of forest resources. Many private forest landowners are difficult to identify, especially in the context of landscapes undergoing rapid change. This five-year project sought to identify the full spectrum of forest landowners in Pennsylvania (ranging down to one acre), conduct large scale (n=6600) mail surveys of

these landowners, and calibrate their beliefs about the sustainability of their forest management practices through site visits by State Bureau of Forestry Service Foresters. Moving beyond a snapshot view, the five-year longitudinal nature of the project allows us to track changes in ownership over time (i.e., address parcelization) and management practices.

In 2008, the project team, based primarily at Penn State University, gave 4 presentations at professional meetings on the first round of data collection (2006 statewide survey of 6000 landowners and 2007 property visits of approximately 100 landowners). Three manuscripts are in preparation from this data. The second wave of mail survey data (n=6000) was collected in 2008: we achieved a response rate of 49%. Non-respondent follow-up interviews were conducted in late 2008 and early 2009.

Presentations:

Stedman, R., A. Metcalf, C. Longmire, J. Finley, and A.E. Luloff. 2008. In the eye of the beholder: comparing landowner and forester perspectives on forest health and sustainability. International Symposium for Society and Natural Resources, Burlington, VT, June.

Finley, J., A. Metcalf, A.E. Luloff, and R. Stedman. 2008. Estimating the population of private forest landowners in Pennsylvania: Implications for outreach, management, and stewardship of private forestlands. International Symposium for Society and Natural Resources, Burlington, VT, June.

Gruver, J., A. Metcalf, A Muth, J. Finley, A.E. Luloff, and R. Stedman. 2008. Forest parcelization and the future of Penn's Woods. International Symposium for Society and Natural Resources, Burlington, VT, June.

Longmire, C.L., A. Metcalf, R. Stedman, J. Finley, and A.E. Luloff. 2008. Cross-boundary cooperation among private forest landowners: a comparison of survey results from Tennessee and Pennsylvania. International Symposium for Society and Natural Resources, Burlington, VT, June.

Utilizing Motivations, Behaviors, and Information Preferences to Develop Communication Strategies for Urban Forest Owners

Funded by: Cornell Univ. Agric. Exper. Sta., Cornell Cooperative Extension, USDA Initiative for Future Agriculture & Food Systems

Collaborators: Peter Smallidge (Dept. of Nat. Resour.); Amy Ross-Davis (USDA Forest Service)

HDRU Contact Persons:

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Communicating effectively with family forest owners remains a significant challenge for public and private outreach programs designed to encourage sustainable management of private lands. Benefits-based audience segmentation has emerged as a useful tool to both gain a deeper understanding of family forest owners and inform outreach efforts. While typologies of family forest owners have been constructed using a variety of variables, a recent proposition in the literature has advocated the use benefits that landowners value as the basis of the typology. This approach allows those engaged in outreach with family forest owners to ascertain landowner motivations relatively quickly and easily and put that information to use in guiding outreach.

We conducted a benefits-based audience segmentation analysis of forest owners residing in urban areas of New York State and four types of forest owners emerged: working the land owners (35%), recreational enthusiasts (32%), woodland retreat owners (17%), and moderately interested owners (16%). The data from this study come from a sample of 1,100 forest owners residing in urban counties of New York who were surveyed on topics of ownership motivations, past and future management activities, preferred communication methods, and demographics. Landowner segmentation analysis, while potentially useful on its own, will be most powerful when coupled with a targeted communication and evaluation strategy.

Publications:

Broussard, S.R., N. Connelly, T. Brown, and P. Smallidge. 2008. Management activities of private forest landowners in New York State. *Research and Policy Brief Series, Issue 15*, CaRDI, Cornell Univ., Ithaca, NY.

Broussard, S.R., Connelly, N., Brown, T., and P. Smallidge. 2008. Information and communication preferences of private forest landowners in New York State. *Research and Policy Brief Series, Issue 19*, CaRDI, Cornell Univ., Ithaca, NY.

Community-Based Forestry on Private Lands

Funded by: Ford Foundation

Collaborators: Heidi Ballard (University of California-Davis); Ceclia Danks (University of Vermont); Steven Daniels (Utah State University); Melanie McDermott, (Rutgers University), Andrew Seidl (Colorado State University); Victoria Sturtevant (Southern Oregon University); Tony Cheng (Project Coordinator-Colo-

rado State University); Maria Fernandez-Gimenez (Project Coordinator-Colorado State University)

HDRU Contact Person:

Shorna Broussard Allred, srb237@cornell.edu

Community based forestry (CBF) groups often act as intermediaries and engage in boundary spanning activities. While CBF groups can be conceptualized in many ways, this paper applies an institutional lens to the work of these unique organizations. Intermediary organizations build capacity among and enhance impact within a community, negotiate expertise within a socio-political context, and serve as trusted organizations that can mediate the public sector. Data were collected through semi-structured interviews held with intermediary organization staff, clientele, and partners. In addition to the interviews, a content analysis was conducted of organization planning and reporting documents.

Results revealed four major themes with regard to the intermediary and boundary spanning roles of community-based forestry groups: challenges, trust, wider impacts, and capacity. Challenges identified were associated with reaching and working effectively with landowners of smaller acreages, difficulties in effectively quantifying and communicating the outcomes of their activities, government resistance to change, and funding stability. Building trust and capacity were essential intermediary roles of the community-based forestry groups. Wider policy impacts were achieved by the community based forestry groups, but institutionalization of those policy changes was dependent upon CBF organization and political leadership and external factors.

Despite the essential roles of intermediaries, they often lack legitimacy and policymakers are often uninformed as to the value added of these organizations. Intermediaries are a complement to government and act to fill gaps and build the capacity of low-asset groups or individuals. Thus a more equitable distribution of resources can be achieved than would be possible without the community-based forestry group acting as an intermediary. Findings from this study are currently being prepared for publication.

Project Website:

<http://welcome.warnercnr.colostate.edu/frws/cbf/>

Communities in Transition

Funded by: Northeast States Research Cooperative

HDRU Contact Person:

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Second homes are becoming increasingly prevalent in natural resource-rich areas in the Northern Forest Region. The retirement of the baby boom generation is likely to result in future second home growth.

However, the potential economic, ecological, and social impacts of second home development remain poorly understood, leaving many rural communities ill-equipped to deal with these changes. This project, initiated in 2007, uses qualitative (interview) and quantitative (survey-based research) methods to examine the well-being of forest-based communities in New York, Vermont, New Hampshire, and Maine that are undergoing transition to tourism and/or second home-based economies.

Several presentations were made on this project in 2008. Plans are under way to submit a USDA National Needs proposal in 2009 in collaboration with Penn State university colleagues, and also to hire a graduate student on the Adirondack region component of the project.



Presentations:

Stedman, R., and J. Weigle. 2008. The use of narrative based community imagery analysis in rural amenity areas. Annual meetings of the Rural Sociological Society, Manchester, NH, July.

Weigle, J., R. Stedman, and A.E. Luloff. 2008. Assessment of public and private landownership patterns: a northcentral Pennsylvania case study. International Symposium for Society and Natural Resources, Burlington, VT, June.

Brasier, K., J. Findeis, J. Kaye, D. Miller, D. Mortensen, R. Salcedo., and R. Stedman. 2008. Human population dispersion and the structure of agriculture in the Susquehanna Rural-Exurban-Urban Transition Zone. Poster presented at the Annual Meetings of the Rural Sociological Society, Manchester, NH, July.

Assessing the Capacity to Expand Maple Syrup Production in New York State.

Funded by: Lewis County, NY

Collaborator: Michael Farrell, Natural Resources

HDRU Contact Person:

Rich Stedman, rcs6@cornell.edu

Maple syrup production may represent a viable and sustainable economic development strategy. Potential exists for expansion of the industry in New York State, which taps a very small proportion of its

tappable maple stock compared to neighboring states and provinces. The potential for expansion is especially strong given recent trends in Canadian / US Dollar exchange rates. A new project is exploring current producer willingness to expand production (and

barriers to doing so). In 2008, we implemented a mail survey of 2000 current maple producers (and achieved a 52.5% response rate). In 2009, we will implement a mail survey with a stratified random sample of NYS landowners to gauge their interest in and perceived barriers to entry.

Natural Resources Communication and Education

Communication and education (C&E) programs and courses are fundamental to natural resource management. State and federal agencies, universities, state cooperative extension services, and nongovernment organizations conduct a wide variety of programs and courses. C&E programs perform an important role in bringing informed public involvement to decision making and influencing public perception of and behavior toward natural resources and their management. The traditional focus of C&E efforts has been to raise informational levels of the public. The HDRU fulfills this role both through its teaching and through a variety of Extension and outreach programs. It is also frequently involved in conducting C&E program evaluations.

The U.S. Fish and Wildlife Service, The U.S. Geological Survey, and Professional Societies

Funded by: The Wildlife Society

HDRU Contact Person:

Bruce Lauber, tbl3@cornell.edu

The Wildlife Society (TWS), the U.S. Fish and Wildlife Service (USFWS), and the U.S. Geological Survey (USGS) developed a partnership in part to explore how the involvement of USFWS and USGS biologists in scientific and professional societies could contribute to the scientific capabilities of federal biologists. Contributing to that effort, we conducted a study to determine whether and how USFWS and USGS biologists are involved in TWS, the American Fisheries Society (AFS), and other scientific and professional societies and to identify the factors that influence their involvement.

Two bodies of theory serve as the theoretical foundation for this work. The Theory of Planned Behavior identifies those factors that can influence whether people engage in particular behaviors (such as becoming involved in scientific and professional societies). As such, it can help identify the types of factors that might influence involvement in scientific and professional societies. Research on organizational and professional commitment can help identify the specific factors within these types that are likely to influence behaviors of

professional employees relative to their employing organizations and their professions.

During the past year, we completed two peer-reviewed publications based on a world wide web survey of 3,755 USFWS and 932 USGS Biological Resource Division biologists and other scientists working throughout the states. Our results show that membership in societies is correlated with factors such as external constraints (e.g., family responsibilities and costs), supervisor support for membership, and the membership of friends, peers, and supervisors in scientific societies. These results suggest that membership in scientific societies is heavily influenced by the organizational culture of employing agencies. Agencies seeking to increase their employees' membership, and thus benefits from participation, in scientific societies will be most successful if they create a culture in which involvement in scientific societies is expected and in which peers and supervisors also participate.

Publications:

Lauber, T.B., E.J. Taylor, and B.A. Knuth. 2009. Factors influencing membership of U.S. Fish and Wildlife Service and U.S. Geological Survey biologists in the American Fisheries Society. *Fisheries* 34(1):9-19

Lauber, T.B., E.J. Taylor, and D.J. Decker. In press. Factors influencing membership of federal wildlife biologists in The Wildlife Society. *Journal of Wildlife Management*.

Presentation:

Lauber, T.B., E.J. Taylor, D.J. Decker, and B.A. Knuth. 2008. Professional development among natural resource professionals: the influence of organizational and professional commitment. International Symposium on Society and Resource Management. Burlington, VT, June.



Teaching: Natural Resource Planning and Management

Bruce Lauber continued to teach Natural Resource Planning and Management (NTRES 330), a core course in the Department of Natural Resources curriculum required of all natural resource majors. The course focuses on the principles of planning as applied to natural resource issues. The 44 students enrolled in the course in 2008 worked together in case study groups throughout the semester to develop management plans for current controversial natural resource issues. Each student played the role of a stakeholder involved in an issue, researched the interests of the stakeholder, and advocated that those interests be reflected in the final plan developed. The case study groups focused on the management of large mammals in the Greater Yellowstone Ecosystem, balancing salmon restoration with hydroelectric power in the Columbia River basin, protecting elephant populations while minimizing problems caused by elephants in Kenya, meeting both environmental and economic needs in the Adirondacks, and reducing the impacts of feral and free-roaming cats on wildlife in Florida.

Other Teaching Contributions by HDRU Staff

Jody Enck supervised Meredith Odato during 07-08 on her senior honors thesis project, "Assessing trends in Cornell University undergraduates' attitudes about the environment and sustainability." Her research was based on an internet survey of 2,000 Cornell University students and included trend questions from previous surveys of Cornell students conducted in

1970, 1980, and 1990, as well as questions directly aimed at attitudes and beliefs about Cornell's current sustainability initiatives.

Currently ('08-'09), Jody is co-advising (with B. Lauber) Julie Eitner on her honors thesis project, "Factors affecting behavioral intentions of National Park Service (NPS) staff to facilitate geocaching on NPS units." Julie's work is an outgrowth of her internship in the NPS Policy Office during summer 2008 during which she participated in a policy review of geocaching and related activities on NPS units.

Guest Lectures:

Gore, M. "Applying concepts of risk to human dimensions of wildlife management." Fisheries and Wildlife 434 (Human Dimensions of Fisheries and Wildlife Management), Michigan State University, Spring.

Gore, M. "Effects on stakeholder tolerance of black bears from an outreach intervention." Fisheries and Wildlife 434 (Human Dimensions of Fisheries and Wildlife Management), Michigan State University, Spring .

Other Publication on Natural Resources Communication and Education:

Lauber, T.B., D.J. Decker, and B.A. Knuth. 2008. Social networks and community-based natural resource management. *Environmental Management* 42:677-687.

Water Resources Management and Policy

Using Social Indicators to Evaluate Non-point Source Pollution Projects

Funded by: USDA-CSREES National Integrated Water Quality Program

HDRU Contact Person:

Shorna Broussard Allred, srb237@cornell.edu

Collaborators: Linda Stalker Prokopy (PI), (Purdue University), Ken Genskow (PI) (University of Wisconsin – Madison), Joe Bonnell (The Ohio State University), Asligul Gocmen (University of Wisconsin – Madison), Rebecca Power (University of Wisconsin Extension)

The research, teaching, and outreach team included in this project has been working together to develop a framework for measuring social indicators that can be used to evaluate nonpoint source water projects funded through Section 319 of the Clean Water Act, adminis

tered by USEPA and state agencies with water quality responsibilities. This project builds on existing knowledge about the factors shown to influence adoption of conservation practices. We utilize a social indicators framework (attitudes, knowledge and awareness, capacity, behavior adoption, and contextual/demographic factors) as a tool to identify the salient factors that promote and hinder farmer adoption of conservation practices in three Midwestern watersheds. We also contribute to the understanding of best education practices by designing interventions (education, outreach, and incentive programs) based on an in-depth understanding of the target audience and social context and closely monitoring the outcomes of those interventions. Most importantly, we will build the capacity of watershed project managers to apply the tools developed in this study to incorporate information about the social context in their watersheds to address water quality issues more effectively. This project is currently in the data analysis stage.

Publication:

Prokopy, L.S., K. Genskow, J., Asher,, A. Baumgart-Getz, J.E. Bonnell, S.R., Broussard, C. Curtis, K. Floress, K. McDermaid, R. Power, and D. Wood. In press. Designing a regional system of social indicators to evaluate nonpoint source water projects. *Journal of Extension*.

Assessing Riparian Landowner Willingness to Implement Best Management Practices (BMPs)

Funded by: USDA Conservation Enhancement Assessment Program

Collaborators: James Shortle, Robert Brooks, Robert Carline, Penn State.

HDRU Contact Person:

Rich Stedman, rcs6@cornell.edu

This study examines agricultural and non-agricultural riparian landowners' willingness to implement and maintain a suite of BMPs tied to the provision of local and extra-local water quality benefits. This study examines two primary questions: (1) the maintenance of BMPs (most work has focused on adoption as a dichotomous process and fails to address the different sets of factors that may be related to the adequacy of BMP maintenance; and (2) the implications of agricultural versus non-agricultural land use. In particular, policies, incentives and disincentives have been tied to agricultural land uses. As such, they may not well-represent many watersheds undergoing urbanization. Factors tied to attitudinal dispositions of landowners are addressed, as are landscape-level characteristics (e.g., parcel size, land use and land tenure), social norms, and regulatory structure.

This was an active study in 2008. Ann Armstrong, the graduate student supported by this project, conducted qualitative interviews with policy makers, agricultural and non-agricultural land owners in the Spring Creek (PA) watershed, and began development of a mail survey to collect data in this area, which will be implemented in 2009.

Publications:

Stedman, R.C., E.E. James, and P.J. Kleinman. 2008. Local land uses and downstream benefits: How farmer attitudes influence watershed conservation practices. *Rural New York Minute*, Cornell University Community and Rural Development Institute. 15.

Linking Watershed and Community Development Groups to Build Socio-ecological Resilience in the Hudson River Watershed

Funded by: Cornell Univ.Agric. Exper. Sta.

HDRU Contact Person:

Rich Stedman, rcs6@cornell.edu

This project addresses socio-ecological resilience in the Hudson River Watershed (HRW) by studying partnerships between citizen groups that address community/economic vitality and those emphasizing ecological quality. Watersheds bring together the well-being of ecosystems and the people living in them; management works when diverse interests come together. In complex ecosystems work, relatively little is known about citizen group capacity to partner across issues and places, nor the outcomes of such partnerships in ecosystem management. This project examines citizen group partnerships across sites and issues, and identifies outcomes of these partnerships and key barriers to building and using them.

Work is just beginning on this project. We will use semi-structured interviews with citizen-based groups and governments across a wide range of goals and locations in the HRW. In 2008, Ann Armstrong was awarded a Cornell Duke Conservation Fellowship to begin this work as a summer internship.

Other Publication in Water Resources Management:

Connelly, N.A., T.L. Brown, and T.P. Holmes. 2008. Using GIS and spatial statistics to examine patterns of crowding on Lake George. *Adirondack Journal of Environmental Studies* 14(2):22-27.



Sense of Place

Sense of place, or the meanings and attachments that individuals and/or groups hold for a spatial setting, has become an important construct in resource management. Sense of place is based on experience with a setting that is based on a certain level of ecological quality of the setting, as well as direct provision of experiential opportunities by resource managers. The goal of this research is to understand the ecological and community-based factors associated with the local meanings of landscape, understand how these meanings are tied to local attachment, how this attachment potentially predicts human behavior, and how these relationships are similar or different across a wide range of socio-ecological settings.

A mix of qualitative and quantitative methods have been utilized for discrete studies under this subject heading, as articulated below.

Lake Quality and Sense of Place

Funded by: National Science Foundation

Collaborators: Joan Brehm, Illinois State University; Brian Eisenhauser, Plymouth State University

HDRU Contact Person:
Rich Stedman, rcs6@cornell.edu

Understanding the relationship between sense of place and perceived environmental quality is crucial if managers are serious about recent enthusiasm for “managing for a sense of place.” A survey was implemented in ten lake districts (total n=2,278 respondents), including five sites in North America and five in Europe. These sites share several commonalities: they all lie at fairly similar latitudes in the Northern Hemisphere, and they are all regions relatively rich in lake resources. This research explored how these findings are similar or different across sites with very different ecological and social characteristics.

Work in 2008 included a comparative analysis of the relationship between environmental perception, sense of place, and environmental behavior from data collected in lake districts in New Hampshire, Illinois, and Wisconsin. Also, with Cornell Natural Resources grad student Alex Kudryavtsev, we are re-analyzing data collected in north-temperate lake districts around the world, using structural equation modeling to assess the relationship between perceived environmental quality and place attachment.

Publication:

Stedman, R.C. 2008. What do we “mean” by place meanings? Implications of place meanings for managers and practitioners. Pp. 61-81 in L.E. Kruger, T. Hall, and M.C. Stiefel, eds. *Understanding Concepts of Place in Recreation Research and Management*. Gen. Tech. Rep. PNW-GTR-744. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station, Portland, OR.

Presentation:

Brehm, J., Eisenhauser, B., and R. Stedman. 2008. A comparative analysis of the nexus of place attachment and behavior. International Symposium for Society and Natural Resources, Burlington, VT. June.

Photo-Based Methods for Exploring Sense of Place

Funded by: Sustainable Forest Management Network Centres of Excellence (Canada)

Collaborators: Ben Amsden, Plymouth State University; Linda Krueger, U.S. Forest Service

HDRU Contact Person:
Rich Stedman, rcs6@cornell.edu

High amenity communities, such as those that are gateways to national parks and protected areas, face a unique set of challenges and opportunities around maintaining local sense of place, or the preferred sets of local meanings that underpin attachment and place-protective behavior. We are utilizing a qualitative, “resident-employed photography” approach to elicit respondent community meanings and attachment in high amenity communities in Canada and Alaska (and with a sample of natural resource-based volunteers in the latter).

In 2008 we participated in a workshop “Connecting Place Research to Decision-Making” in Ashland, Wisconsin in which we developed a concept for an edited volume, with workshop participants contributing chapters. Work also continued with combining data collected using the photo-based method with Linda Krueger’s work in Washington State on volunteers.

Natural Resources Planning and Evaluation

Natural resources planning involves public input particularly at the beginning of the planning cycle, and at the end, through assessment or evaluation, as input to plan revision. The HDRU has undertaken research and outreach in a number of situations involving planning. In 2005, we had the opportunity to work with the St. Regis Mohawk Tribe in Northern New York in their efforts to develop a natural resources plan for tribal lands. In 2006, we worked with the Wildlife Conservation Society as it assessed its efforts at building capacity for conservation in the Adirondacks. In 2007 we began work on a new round of strategic planning by the American Fisheries Society.

American Fisheries Society (AFS) Membership Survey

Funded by: American Fisheries Society

HDRU Contact Person:
Nancy Connelly, nac4@cornell.edu

Every few years, AFS conducts a membership survey for use in its strategic planning. HDRU has worked with AFS on the last two surveys, the most recent of which occurred in 2004. In 2008 we implemented another membership survey via the web. A random sample of 1,500 AFS members was sent e-mail invitations to participate in the survey; 56% responded.

Based on survey results, the profile of AFS membership has changed little in the past 11 years, except that female membership increased from 16% in 1997 to 24% in 2008. Regarding publications, respondents felt that the reputation of AFS journals was quite high. Most respondents (86%) thought that if they were an author of an AFS publication, they would be willing to have their work published in an on-line journal rather than a print journal (with electronic copy). Looking to the future, most respondents (88%) support the development of web-based broadcasts of symposia from the annual meeting, thus allowing members to view the symposia without having to travel to the meeting.

Among nine options for future priorities for AFS, enhancing public outreach was the most popular. Almost three-quarters (71%) of respondents thought AFS should put more emphasis on public outreach, such as developing products for public education. Virtually all respondents (92%) thought AFS should coordinate with the Fisheries Conservation Foundation, Sea Grant, or other groups such as anglers and teachers to increase public outreach and advocacy.

A variety of other topics (e.g., AFS governance, recruitment and retention) were covered in the survey, the results of which can be found in the report cited below.

Publication:

Connelly, N.A., and T.L. Brown. 2008. 2008 AFS membership study. HDRU Publ. 08-6. Dept. Nat. Resour., Cornell Univ., Ithaca, NY. 20pp.

Search Conference on Research Needs Related to Lake Ontario

Funded by: Great Lakes Regional Research and Information Network/New York Sea Grant Program.

HDRU Contact Person:
Bruce Lauber, tbl3@cornell.edu

Bruce Lauber and Tom Brown helped the Great Lakes Regional Research and Information Network (GLRRIN) design and implement search conferences to identify research and information needs for the Lake Ontario system. Search conferences are methodologies for participatory planning that rely on diverse representation of stakeholders and democratic procedures to reach conclusions that are widely viewed as legitimate. The two search conferences were facilitated by the HDRU for GLRRIN in March and April 2008. A written report was produced summarizing the key information needs identified by participants. Jack Mattice and Dale Baker of the New York Sea Grant Program served as planning coordinators for the conferences. The planning committee consisted of representatives from both the New York and Canadian sides of Lake Ontario.



Publication:

Lauber, T.B. and T.L. Brown. 2008. Information needs for Lake Ontario: The Great Lakes Regional Research and Information Network Search Conferences. HDRU Publ. No. 08-3. Dept. of Nat. Resour., Cornell Univ., Ithaca, N.Y. 61pp.

Summary of Consultations, Outreach Activities, Honors, Awards, and other Scholarly Activities

The HDRU has traditionally made consultation and outreach a part of its research partnership with NYSDEC. The HDRU also provides consultation and conducts workshops for other resource management agencies. In addition, Unit faculty and staff are active in a wide variety of professional activities. Examples of activities for 2008 are summarized below.

Consultation to the New York Fish and Wildlife Management Board

HDRU Leader Tom Brown continued to serve as the College of Agriculture and Life Sciences representative to the New York Fish and Wildlife Management Board. In 2008 this responsibility entailed preparing semi-annual progress reports to keep Board members aware of HDRU research and other work from the Department of Natural Resources that is relevant to the Board's focus on habitat and access issues.

Small Game and Furbearer Harvest Surveys: A Cooperative Effort with NYSDEC

HDRU staff worked with Bureau of Wildlife staff in a collaborative effort to implement NYSDEC's annual small game and furbearer harvest surveys. HDRU staff designed survey instruments and assumed responsibility for implementation of survey mailings (sample sizes of 5,000 and 4,500). NYSDEC assumed responsibility for data management and analysis.

Professional Training and Outreach: Integrating Human Dimensions in Wildlife Management

HDRU Co-Leader Dan Decker, Shawn Riley (MSU) and Kirsten Leong (NPS) worked with previously trained coaches with the Florida Fish and Wildlife Conservation Commission (FWC) to deliver a "Thinking Like a Manager" workshop to an additional cohort of staff in FWC. The 4-day workshop was held at Camp Weed in Live Oak, FL during May 2008.

HDRU Co-leader Dan Decker and Bill Siemer developed and instructed in a workshop based on concepts in the book they co-authored, *Thinking Like a Manager*. Colleague Elsa Haubold from Florida Fish and Wildlife Commission also instructed. The workshop was a condensed version of the 4-day workshop offered to wildlife professionals in the Florida Fish and Wildlife Conservation Commission in 2007 and 2008. The 2008 mini-workshop was offered twice: as an in-service training experience for a group of professionals in a leadership training program, and to a group of 28 attendees of the 2008 conference *Pathways to Success* (Estes Park, CO, September 28, 2008).

HDRU Co-Leader Dan Decker advised various division, section and program leaders in Florida Fish and Wildlife Conservation Commission on integrating human dimensions considerations into FWC's "way of doing business" (e.g., imperiled species), including a variety of specific management programs (e.g., Florida panther, coastal wildlife, Florida black bear).

HDRU Co-Leader Dan Decker co-instructed with Tara Teel (CSU) a workshop on integrating HD into management, focusing on applications of HD concepts and insight into management decision making for wildlife programs. This was part of a formal training session for 24 participants from a variety of wildlife agencies, concurrent with the Pathways to Success conference in Estes Park, CO during fall 2008.

Related Publication:

Decker, D., Siemer, W., Leong, K. and Riley, S. 2008. A guide to developing manager's model from scratch, Fall 2008 edition. Human Dimensions Research Unit. Department of Natural Resources, Cornell University, Ithaca, NY.

"Pathways to Success"—International Conference on Human Dimensions of Fish and Wildlife Management

HDRU Co-leader Dan Decker represented Cornell HDRU in planning an international conference on human dimensions of fish and wildlife management, held fall 2008 in Estes Park, CO. Dan also served as co-editor of the book *Wildlife and Society* (2008) published by Island Press in conjunction with the conference. Dan and colleagues Bill Siemer, Kirsten Leong, Shawn Riley, Brent Rudolph and Len Carpenter authored the concluding chapter for the book, "Conclusion: What is Wildlife Management?" Dan also presented a paper on the topic of the chapter.

Consultation to Harvard School of Public Health

HDRU Co-leader Barbara Knuth was an invited panelist at a full-day workshop on Risks of PCB Exposure and Benefits Associated with Consumption of Marine Fish, held at the Harvard School of Public Health and attended by a diverse group of academics, agency scientists and managers, and stakeholder groups.

National Academies Service and Impact

HDRU Co-leader Barbara Knuth was named to serve on the Ocean Studies Board (OSB) of the National Academies. In that capacity, she brings a social science perspective to the deliberations of that body. In addition, the results from a 2006 Committee that worked under the auspices of the OSB, the Committee on the Review of Recreational Fisheries Survey Methods, on which Knuth served and Natural Resources Professor Patrick Sullivan chaired, had a major impact on federal fisheries policy. The Committee report recommended improvements were needed in the federal government's capacity to estimate harvest rates and other fisheries statistics because of the paucity of information available on recreational anglers. In response, NOAA Fisheries Service is creating a national saltwater angler registry of all marine recreational anglers. The Committee's recommendation became law in 2007 with the reauthorization of the Magnuson-Stevens Act; NOAA recently finalized the rule to implement this new system. This new information will provide critical information to help strategically manage and rebuild fish stocks.

Consultation to the Virginia Department of Environmental Quality

HDRU Co-leader Barbara Knuth served on the Scientific Peer Review Panel to review the scientific content of a human health risk assessment study focused on methylmercury exposure in humans via fish consumption, for a project sponsored by the Virginia Department of Environmental Quality.

Implementing Ecosystem-based Management

HDRU Co-leader Barbara Knuth served as an appointed member of the Scientific Advisory Group of the New York Oceans and Great Lakes Ecosystem Conservation Council. A key charge of that group was to advise the New York state government on issues of implementing an ecosystem-based management approach to ocean, Great Lakes, and coastal systems.

Council of Environmental Deans and Directors

HDRU Co-leader Barbara Knuth serves at the request of the Provost as Cornell's representative on the Council of Environmental Deans and Directors, the university affiliate program of the National Council for Science and the Environment.

Service on Boards

HDRU Co-leader Dan Decker completed his term as chair of the Board of Governors for the New York Sea Grant Institute; he continues serving as board member representing Cornell.

Leadership in Professional Societies

HDRU Co-leader Barbara Knuth concluded her term as Vice-Chair of the World Council of Fisheries Societies, and served on the International Steering Committee for the 5th World Fisheries Congress held in October, 2008 in Yokohama, Japan. At the World Congress, she delivered a Presidential Address and presented a Salutation to the Emperor and Empress of Japan. Knuth continued her service with the American Fisheries Society as a member of a team presenting a leadership development workshop for members at the annual AFS meeting. Her focus was on strategic planning.



Participation in Human Dimensions, National Flyways Council

HDRU staffer Jody Enck was invited to participate in the Human Dimensions Working Group of the National Flyway Council, with immediate focus on developing conceptual models related to recruitment and retention of waterfowl hunters. This occurred in collaboration with human dimensions researchers Andy Radaeke (Missouri Dept. of Conservation), David Fulton (Univ. of Minnesota CFWRU), and Kevin Hunt (Mississippi State Univ.).

Other Academic and Professional Briefs

HDRU Co-Leader Dan Decker was a plenary speaker at the 2008 Northeast Fish and Wildlife Conference, where he discussed the need, challenges and opportunities for integration of human dimensions in wildlife management.

HDRU leader Tom Brown continued to serve as an associate editor for the *Journal of Wildlife Management*.

Rich Stedman continues to serve on the editorial boards for the journals *Society and Natural Resources*, *Forestry*, and *Wildlife Biology*. He also continues to serve on the governing council for the International Association for Society and Resources Management.

Heather Wiczorek Hudenko completed her tenure as one of the 20 people selected to participate in the Emerging Wildlife Conservation Leaders (EWCL) program. During the program Heather received training in capacity building, campaign development, and cross-organizational collaboration. With her teammates, Heather conducted a two-year project focusing on conservation of the endangered jaguar population living along the US-Mexico border. The program is sponsored by: the U.S. Fish & Wildlife Service; Defenders of Wildlife; the White Oak Conservation Center/Howard Gilman Foundation; the International Fund for Animal Welfare; and the Wildlife Conservation Network.